

**IN THE UNITED STATES PATENT DESIGNATED OFFICE (DO/US)
(National Phase of International App.: PCT/DE01/02485, W/O 02/04146 A1)**

In re the
application of: **Christian BOEHNKE**

International Application No.: **PCT/DE01/02485**

International Filing Date: **30 June 2001**

U.S. Serial No.: **Not Yet Assigned**

Filed: **Herewith**

For: **DEVICE AND METHOD FOR MELTING
AND CONVEYING MATERIAL**

Attorney Docket No.: **HHI-040US**

BOX PCT
Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Preliminary to examination of the above-referenced patent application, please
amend the application as follows.

In the Specification:

Page 1, line 2, after the title, insert the following "**Background of the
Invention**".

Page 1, lines 3-4, please delete "according to the preamble of claim 1", and
"according to the preamble of claim 6", and after word method insert --for conveying
material--.

Page 1, line 6, please delete "according to the species".

Page 1, lines 34-35, please delete "according to the species".

Page 2, line 5, insert the following title: "**Summary of the Invention**".

Page 2, lines 11-12, please delete the paragraph.

Page 4, line 29, insert the following title: "**Brief Description of the Drawings**".

Page 4, line 35, please insert the following title: "**Description of Illustrated Embodiment**".

In the Claims

Please amend claims 1-7 as follows:

1. Device for melting and conveying a material, comprising
a conveying channel having an admission opening for the material and a discharge opening for at least partially molten material,
one or more heating devices for heating one of the conveying channel and the material between the admission opening and the discharge opening, and
a slide which is reciprocally movable so as to convey the material from the admission opening to the discharge opening, wherein the conveying channel is tubular and has a double-walled configuration including an internal tube and an external tube, the slide being designed as a sliding sleeve which is located between the internal tube and the external tube, and wherein the slide includes a closing sleeve to close or open the conveying channel and a conveying sleeve which is movable independently of the closing sleeve.

2. Device according to claim 1, wherein the conveying channel is reduced from a first diameter in a region of the admission opening to a smaller diameter in a region of the discharge opening, wherein the internal and external tubes of the conveying channel are axially movable toward each other, between a conveying position in which passage between the internal tube and the external tube is achieved, and a closing position in which the internal and external tubes are in close proximity to each other such that a material flow between the tubes is impeded.
3. Device according to claim 1, wherein one of the internal and external tubes forms a plug for the discharge opening formed by the other tube, wherein the tubes are movable toward each other between an opening position and a closing position to open or close the discharge opening.
4. Device according to claim 1, wherein the internal tube of the conveying channel is a solid, rod-type or cylindrical component.
5. Device according to claim 1, wherein the heating device is arranged at least one of radially inside and radially outside the conveying channel.
6. Method for melting and conveying a material, comprising the steps of
introducing the material through an admission opening into a conveying channel ,
discharging the material from the channel through a discharge opening,
moving the material from the admission opening to the discharge opening with a
slide, and
heating the material when disposed in the conveying channel by one or more
heating devices which are located between the admission opening and the discharge
opening, wherein the material when at least partially melted is conveyed through
narrowings formed in the conveying channel.

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REMARKS

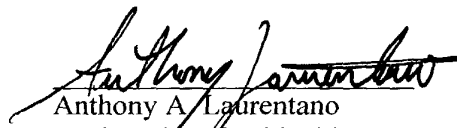
Applicants amend the specification to address minor formal matters, such as introducing appropriate section headers. Applicants also amend the claims to provide proper antecedent basis, and to address other matters of form. The foregoing amendments introduce no new matter and are not related to issues of patentability.

Entry of the foregoing Preliminary Amendment is in order and requested.

If there are any questions regarding the proposed amendments to the application, we invite the Examiner to call Applicants' representative at the telephone number below.

Respectfully submitted,

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7. Method according to claim 6, wherein the material is conveyed through a conveying channel having an annular cross section, further comprising the step of heating the material radially from outside the annular cross section and radially from inside the annular cross section.

Version With Markings To Show Changes Made

In the Specification

Page 1, lines 3-4:

The invention relates to a device ~~according to the preamble of claim 1~~ and a method ~~according to the preamble of claim 6~~ for conveying material.

Page 1, line 6:

Devices and methods ~~according to the species~~ are known from German Patent 36 40 370 C2, European Patent 778 099 A3, European Patent 904 875 A1 or World Patent 99/50007.

Page 1, lines 34-35:

When a slide replaces a rotating screw conveyor in the device ~~according to the species~~, the effects of internal material friction, such as those produced by kneading or stirring actions, are largely eliminated. There is thus hardly any introduction of heat into the material to be melted from the conveying device but only from the heating equipment such that the melting process may be controlled simply and extremely precisely by this heating equipment independently of the conveying function which is performed by the slide. Heating and conveying may thus be controlled as functions which are essentially independent of one another.

In the Claims

Please amend claims 1-7 as follows.

1. Device ~~(1)~~ for melting and conveying a material, ~~such as plastic or metal,~~
~~including comprising~~
a conveying channel ~~(5) which contains~~ having an admission opening ~~(9)~~ for the material, ~~as well as and~~ a discharge opening ~~(10)~~ for the at least partially molten material,

~~and including one or more heating devices (12) which heat for heating one of the~~
conveying channel (5) ~~and/or the material between the admission opening (9) and the~~
discharge opening (10), and ~~including~~

a slide (6) which is reciprocally movable so as to convey the material from the
admission opening (9) to the discharge opening, (10) ~~wherein characterized in that the~~
conveying channel (5) ~~is of tubular and has a double-walled design configuration, with~~
~~including an internal tube (3) and an external tube (2), the slide (6) being designed as a~~
sliding sleeve which is located between the internal tube (3) and the external tube (2), and
~~wherein the slide (6) being of a two-part design and having includes a closing sleeve (8)~~
to close or open the conveying channel (5) and a conveying sleeve (7) which is movable
independently of the closing sleeve (8).

2. Device according to claim 1, ~~wherein characterized in that~~ the conveying channel
(5) ~~is reduced in stages from the a first diameter in the a region of the admission opening~~
(9) to a smaller diameter in ~~the a region of the discharge opening (10), wherein the two~~
internal and external tubes (2, 3) of the conveying channel (5) ~~being are~~ axially movable
toward each other, between a conveying position in which passage between the
~~individual stages of the internal tube and the external tube is achieved, and a closing~~
position in which ~~the stages of the internal and external tubes (2, 3) are in close~~
proximity to each other such that a material flow between the ~~stages tubes~~ is impeded.

3. Device according to claim 1, ~~wherein characterized in that~~ one of the internal and
external tubes (2, 3) forms a plug (11) for the discharge opening (10) ~~formed by the other~~
tube (2, 3), ~~wherein the tubes (2, 3) being are~~ movable toward each other between an
opening position and a closing position ~~as desired to open or close the discharge opening~~
(10).

4. Device according to claim 1, ~~characterized in that wherein~~ the internal tube of the
conveying channel is ~~designed as~~ a solid, rod-type or cylindrical component.

5. Device according to claim 1, ~~characterized in that~~ wherein the heating devices ~~(12) are~~ is arranged at least one of radially inside and radially outside the conveying channel ~~(5)~~.

6. Method for melting and conveying a material, ~~such as plastic or metal, comprising~~ the steps of

introducing the material ~~being introduced~~ through an admission opening (9) into a conveying channel (5), ~~subsequently conveyed through the conveying channel (5),~~
~~and finally discharged~~ discharging the material from ~~this the~~ channel through a discharge opening ~~(10)~~,

moving the material ~~being moved by a slide (6) which pushes the material~~ from the admission opening (9) to the discharge opening ~~(10)~~ with a slide, and

heating the material ~~being heated while located when disposed~~ in the conveying channel ~~(5)~~ by one or more heating devices ~~(12)~~ which are located between the admission opening and the discharge opening ~~(9, 10)~~, wherein the material ~~and being when~~ at least partially melted, ~~the material being is~~ conveyed through narrowings formed in the conveying channel ~~(5)~~.

7. Method according to claim 6, ~~characterized in that~~ wherein the material is conveyed through a conveying channel (5) ~~with~~ having an annular cross section, further comprising the step of ~~and is heated~~ heating the material radially from outside the annular cross section and radially from inside the annular cross section.